

**REMARKS****I. General**

Claims 1 and 3-37 are pending in the present application, and claim 38 has been added by the present amendment. The outstanding issues in the current Office Action are as follows:

- Claims 1, 3-4, and 8-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Applicants Admitted Prior Art* (hereinafter, *AAPA*) in view of U.S. Patent No. 5,661,485 (hereinafter, *Manuel*) and further in view of U.S. Patent No. 6,400,416 (hereinafter, *Tomasz*).
- Claims 5, and 34-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *AAPA* in view of *Tomasz* and further view of U.S. Patent No. 5,950,119 (hereinafter, *McGeehan*).
- Claims 6 and 7 were not addressed by the present Office Action.

Applicant respectfully requests withdrawal of the rejections in light of the remarks contained herein.

**II. Amendments**

Claim 38 has been added by the present amendment describing the method of claim 34 as “providing, in a television signal transmission head end circuit, mixers for each said mixing step; and providing video head end quality frequency translation by operation of said mixers according to said mixing steps.” This claim has been added to more particularly point out and distinctly claim the subject matter the applicant regards as his invention. Support can be found in the specification generally and specifically on page 10, lines 8-10, and page 17 line 5. No new matter has been added.

### **III. Rejections Under 35 U.S.C. §103(a)**

#### **A. Rejections over *AAPA* in view of *Manuel* and further view of *Tomasz***

On page 2 of the Office Action claims 1, 3-4, and 8-33 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *AAPA* in view of *Manuel* and further view of *Tomasz*. Applicant traverses the rejection and asserts the claims are allowable, at least, for the reasons stated below.

“To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.” M.P.E.P. § 2143. Applicant respectfully asserts that the rejection of record does not satisfy these requirements.

#### **1. Independent Claims 1, 15, and 30**

##### **No Suggestion or Motivation to Combine *AAPA*, *Manuel* and *Tomasz***

The Examiner concedes that *AAPA* does not disclose that the first and second mixers are single sideband mixers. However, the Examiner asserts that it would have been obvious to combine the *AAPA* with *Manuel*. Office Action, page 3. Specifically, the Examiner asserts that the motivation to combine the applied references is to provide a lower inherent noise output and remove unwanted image signal. However, the *AAPA* discloses that the elements of the upconverter are “provided by discrete components in order to accommodate the desired frequency ranges and power levels, as well as to provide an output signal of the desired quality.” Specification page 9, lines 23-24 (Emphasis added). The *AAPA* provides an output signal of the desired quality, and thus one of ordinary skill in the art, that is one who neither undertakes to innovate nor who has the benefit of hindsight, would not have been led to combine such mixers from *Manuel* with *AAPA*. Moreover, *Manuel* teaches that both his single sideband (SSB) modulator and image reject mixer are not “ideal and only suppress[] but do[] not completely remove the unwanted input sideband.” Column 4, lines 2-5. As

such, one of ordinary skill in the art would not have been led to modify the AAPA in view of *Manuel* to achieve a lower inherent noise output as proffered by the Examiner.

“A person of ordinary skill in the art is also presumed to be one who thinks along the line of conventional wisdom in the art and is not one who undertakes to innovate, whether by patient, and often expensive, systematic research or by extraordinary insights.” *Standard Oil Co. v. American Cyanamid Co.*, 227 U.S.P.Q. 293, 298 (Fed. Cir. 1985). The Examiner asserts that because *Manuel* uses a first and second sideband/image reject mixer in Figure 8 one of ordinary skill in the art would have done so with respect to AAPA. However, the circuit of Figure 8 is part of the more complicated circuit of Figures 5 and 7 requiring three single sideband/image reject mixers, and including many additional components connected in a completely different circuit configuration in order to achieve the desired spurious component levels. See column 10, lines 45-64 (describing Figure 8 as part of the multiple channel homodyne receiver illustrated in Figure 7 comprising the RF channel 110 comprising the upper sideband components (66, 68, 74, 78) of Figure 5, and the common lower sideband conversion illustrated in Figure 7 comprising the lower sideband components (67, 69, 70) of Figure 5, and sharing the common oscillator 72 of Figure 5). Moreover, without the more complex circuit, *Manuel* teaches that the SSB modulators only achieve 15 to 20 dB suppression of the unwanted sideband, and are not ideal because they only suppress but do not completely remove the unwanted input sideband.” Column 3, lines 59-61 and column 4, lines 2-5. Thus, one of ordinary skill in the art thinking along the lines of conventional wisdom would not see the benefit of combining the components (single sideband modulator/image reject mixer) from a more complex circuit with the AAPA because they do not provide the desired signal output quality, while the AAPA circuit already provides the desired output quality. Therefore, the Examiner fails to establish a prima facie case under 35 U.S.C §103.

The Examiner further asserts, after the combination of AAPA and *Manuel* has been made (shown hereinabove as improper), that it would have been obvious to one of ordinary skill in the art to provide such circuitry arrangement on a single IC substrate, which the Examiner asserts as being disclosed in *Tomasz*. The Examiner further asserts that one of ordinary skill in the would make the combination in order to provide a compact integrated device that can easily be implemented in a receiver. Office Action, page 3. However, “[t]he

mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination.” M.P.E.P. § 2143.01 citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). There is nothing in *AAPA*, *Manuel*, or *Tomasz* to suggest the desirability of the combination. What the Examiner has done is to use impermissible hindsight by finding the motivation to combine the references from the present invention’s disclosure. Specification, page 17, lines 7-17 (reciting “because of the reduced size, complexity, cost, and/or power requirements of the preferred embodiment frequency translator utilizing substantial circuit integration of the circuit elements, i.e., an upconverter on a chip . . . .”) However, “impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of facts gleaned from the prior art.” M.P.E.P. § 2142. Therefore, the rejection of record is improper because the motivation for the modification is from the Applicant’s disclosure and not in the applied references, or in the knowledge available to one skilled in the art. Office Action page 3. Accordingly, Applicant respectfully requests the withdrawal of the 35 U.S.C §103 rejections of record for claim 1, 15, and 30.

Moreover, “it is improper to combine references where the references teach away from their combination.” M.P.E.P. § 2145(X)(D)(2) (citing *In re Grasselli*, 713 F.2d 731, 734 (Fed. Cir. 1983). The *AAPA* specifically teaches that the “television industry presently uses upconverters that are designed using discrete components . . . such as may be relatively easily relied upon to accommodate the relatively high transmission powers, provide the sharp cutoff filters needed to remove unacceptable spurious signals, and operate throughout the desired frequency spread.” Specification, page 2 lines 24-28. Certainly, this teaches away from the proffered combination. Moreover, the Examiner has not pointed to anything in *Tomasz* or *Manuel* to overcome the teachings of *AAPA* and motivate one of ordinary skill in the art to make the proffered combination of references. Thus, there is no motivation for the proffered combination of applied art, as required to establish a prima facie of obviousness. Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103 rejection of record.

**No Reasonable Expectation of Success**

Applicant respectfully asserts that there is no reasonable expectation of success with respect to the proffered combination. *Manuel's* circuit is a homodyne receiver intended for “[m]odem communication, radar, and related receiving systems.” Column 1, lines 13-14 (emphasis added). The *AAPA* is an upconverter designed for signal transmission using mostly discrete components to accommodate the relatively high transmission powers. See specification, page 2, lines 24-27. Moreover, the upconverters used in the television industry are required to have a spectrally pure output so that information is transmitted in the desired FDM (frequency division multiplex) channel, without producing interfering signals in other FDM channels. Specification, page 2, lines 11-14. Meeting the specifications generally required in the TV industry is often difficult due to the relatively close channelization scheme, the typically broad range of spectrum translated between, the relatively high transmission power requirements, and the typically large amount of information modulated in the signal. Specification, page 2, lines 14-17. Because of these requirements, conventional wisdom in the television industry was to use discrete components. Specification, page 2, lines 24-25.

There nothing disclosed in the references to indicate a reasonable expectation of success when combining the components (SSB modulator/image reject mixer) of *Manuel's* circuit with the *AAPA*, and placing them on the integrated circuit of *Tomasz*. *Manual* discloses that the SSB modulator/image reject mixer do not achieve the desired suppression of the unwanted sidebands. Column 3, lines 59-61. Moreover, the components of *Manual's* circuit are designed for receiver circuits, which require lower power than the higher power circuits designed for signal transmission. Thus, one of ordinary skill in the art would not have had a reasonable expectation of success for the combination of components (that do not achieve the desired amount of signal suppression, and that were designed for lower power use in receivers) from *Manuel* with the *AAPA* (requiring more suppression of spurious components and higher power for signal transmission). This is especially true when further modifying the combination to be disposed on the integrated circuit of *Tomasz*, instead of using the discrete components that were thought to be necessary to accommodate the higher transmission powers, in the conventional wisdom of the television industry. Accordingly, the

Examiner fails to establish a prima facie case of obviousness as required for a proper rejection under 35 U.S.C §103.

## 2. Dependent Claims

Dependent claims 3-4, 8-14, 16-29, and 31-33 depend either directly or indirectly from, and inherit all of the limitations of their respective independent claims 1, 15, 30, shown above to be allowable over the applied art. Therefore, claims 3-4, 8-14, 16-29, and 31-33 are allowable, at least, because of their dependence from claim 1, 15, and 30. Accordingly applicant respectfully requests withdrawal of the 35 U.S.C. § 103 rejection of record.

The Examiner rejects claims 8-10, 23, 25 (this rejection improperly included claim 25, which does not contain a signal amplitude manipulator as a limitation) asserting that the modified communication system of *AAPA* and *Tomasz* disclosed a signal amplitude manipulator disposed on a common IC substrate (*AAPA*, Figure 1/no. 114, *Tomasz* Figure 3/no. 252, 256). Office Action, page 3. However, the Examiner does not offer any motivation, as required by M.P.E.P. § 706.02(j), as to why one of ordinary skill in the art would modify the discrete component system of *AAPA* (against conventional thinking in the television industry) to include an amplitude manipulator disposed on an integrated chip. Further, there is nothing in the applied references to teach or suggest that the signal amplitude manipulator of *Tomasz* could be added to the *AAPA* with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103.

With respect to claims 11-13, 24-25, and 31-32, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed a filter coupled to said first single sideband mixer and disposed on a common IC substrate. Office Action, pages 4-5. As discussed above, the Examiner does not provide any motivation for one of ordinary skill in the art to make the proposed combination. Further, there is nothing in the applied references to teach or suggest that the discrete component system of *AAPA* could be modified with the filter and asserted mixers of *Manuel* and disposed on the IC substrate of *Tomasz* with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103.

Moreover, the claims provide additional novel and non-obvious limitations:

## Claim 11 recites

providing attenuation of image signals substantially equal to a difference between system requirements and image rejection achieved by said first single sideband mixer.

## Claim 12 recites

providing attenuation of carrier leakage signals substantially equal to the difference between system requirements and carrier leakage rejection achieved by said first single sideband mixer.

## Claim 24 recites

filter provides attenuation approximately equal to a difference between system requirements and an amount of image rejection provided by said first single sideband mixer.

## Claim 31 recites

filter is adapted to substantially rely upon said first single sideband mixer for image rejection.

Applicant respectfully asserts that the above limitations are not disclosed in the applied art. The Examiner asserts that the modified *AAPA* (*AAPA*, Figure 1, no. 141, and *Manuel*, Figure 8, no. 68) and *Tomasz* teach or suggest these limitations. *AAPA* does not teach or suggest these limitations because it does not disclose a single sideband mixer used in combination with a filter. *Manuel* does not teach or suggest these limitations. The Examiner cites to Figure 8, no. 68 to teach or suggest these limitations, but *Manuel* merely describes this component as “a highpass filter having a cut-off frequency that is lower than the sum of the lower end of the frequency range of the signal S1 and the frequency of signal 83.” Column 7, 20-23. *Manuel* does not teach or suggest the above cited limitations of claims 11, 12, 24, and 31, nor does *Tomasz*, which is cited for its common IC substrate. Therefore, the applied references do not teach or suggest all of the claim limitations as required for a rejection under 35 U.S.C. § 103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

## Claim 32 recites

at least one filter having frequency selection characteristics insufficient to independently provide head end quality signal characteristics.

Applicant respectfully asserts that the above limitation is not disclosed in the applied art. The Examiner asserts that the modified *AAPA* (*AAPA*, Figure 1, no. 141, and *Manuel*, Figure 8, no. 68) and *Tomasz* teach or suggest these limitations. *AAPA* does not teach or suggest these limitations because it does not disclose Figure 1, no 141 as having frequency selection characteristics. Moreover, if the Examiner meant to cite to filter 142, which as recited in the specification “is a band pass filter which, in order to sufficiently filter the spurious signals . . . must typically provide very sharp pass band cutoffs.” Specification, page 9, lines 14-17. Therefore, filter 142 does not teach or suggest the above limitation. *Manuel* does not teach or suggest this limitation. The Examiner cites to Figure 8, no. 68 to teach or suggest these limitations, but *Manuel* merely describes this component as “a highpass filter having a cut-off frequency that is lower than the sum of the lower end of the frequency range of the signal S1 and the frequency of signal 83.” Column 7, 20-23. This filter is not disclosed to have frequency selection characteristics. Therefore, *Manuel* does not teach or suggest this limitation, nor does *Tomasz* cited to by the Examiner for its common IC substrate. Therefore, the applied references do not teach or suggest all of the limitations of claim 32 as required for a rejection under 35 U.S.C. § 103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

With respect to claim 14, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed a filter disposed external. Office Action, page 4. However, the Examiner does not provide any motivation for one of ordinary skill in the art to make the proposed combination. Further, there is nothing in the applied references to teach or suggest that the filter disposed external to IC substrate of *Tomasz* could be added to a modified discrete component system of *AAPA* with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

With respect to claims 17-19, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed a phase shifter. However, the Examiner does not provide any motivation for one of ordinary skill in the art to make the proposed combination. Further, there is nothing in the applied references to teach or suggest that the discrete component system of *AAPA* modified by phase shifter of *Manuel* disposed on the IC substrate of *Tomasz* could be combined with a reasonable expectation of success, as required to establish a prima



facie case of obviousness under 35 U.S.C §103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

With respect to claims 20 and 33, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed an amplifier, coupled to said input, is disposed on a common IC substrate. Office Action, page 4. The Examiner does not provide any motivation for one of ordinary skill in the art to make the proposed combination. Further, there is nothing in the applied references to teach or suggest that the discrete component system of *AAPA* modified by *Manuel* disposed on the IC substrate of *Tomasz* with an amplifier, coupled to said input, disposed on a common IC substrate could be combined with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

With respect to claim 23, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed an amplifier, coupled to the second output, is disposed on a common IC substrate. Office Action, page 4. As discussed above, the Examiner does not provide any motivation for one of ordinary skill in the art to make the proposed modifications. Further, there is nothing in the applied references to teach or suggest that the discrete component system of *AAPA* modified by *Manuel* disposed on the IC substrate of *Tomasz* with an amplifier coupled to the second output disposed on a common IC substrate could be combined with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103. Accordingly, Applicant respectfully requests that the rejection of record be withdrawn.

With respect to claims 26-29, the Examiner asserts that the modified *AAPA* and *Tomasz* further disclosed said first mixer comprises a fixed frequency carrier and said second mixer comprises a variable frequency carrier. Office Action, page 4-5. The Examiner does not provide any motivation to for one of ordinary skill in the art to make the proposed modifications. Moreover, the Examiners proffered combination does not teach or suggest all of the claim limitations. There is nothing in *Manuel* to teach or suggest a variable frequency carrier. The Examiner replaces mixer 122 with the image reject mixer of *Manuel*, but without further modifying the circuit from *Manuel* the limitation reciting second “mixer comprises a variable frequency carrier” is absent. The Examiner does not cite to *Tomasz* for

this limitation. Therefore the applied references do not teach or suggest all of the claim limitations as required to establish a prima facie case of obviousness.

Further, there is nothing in the applied references to teach or suggest that the discrete component system of *AAPA* could be modified as suggested by the Examiner and disposed on the IC substrate of *Tomasz* with a reasonable expectation of success, as required to establish a prima facie case of obviousness under 35 U.S.C §103. Accordingly, Applicant respectfully requests withdrawal of the rejection of record.

In the rejection above, the Examiner does not address the limitations of claim 27-29 in his rejection of these claims on page 4-5 of the Office Action. Therefore, the Examiner fails to establish a prima facie case of obviousness showing the applied references teach or suggest each and every limitation of the claims. Accordingly, Applicant respectfully request withdrawal of the 35 U.S.C §103 rejections of record.

**B. Rejections over *AAPA* in view of *Tomasz* and further in view of *McGeehan***

On page 5 of the Office Action claims 5 and 34-37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *AAPA* in view of *Tomasz* and further in view of *McGeehan*. Applicant traverses the rejections and asserts the claims are allowable, at least, for the reasons stated below.

Applicant would note that the Examiner relies on *AAPA*, *Tomasz*, and *McGeehan* in the rejection claim 5, which depends from claim 1, and inherits all of the limitations of claim 1 because of its dependence therefrom. The rejection is improper because the Examiner concedes that *AAPA* does not meet every limitation in claim 1, and while the Examiner relies on *Manual* in the rejection of claim 1, it is not recited in the rejection of claim 5, nor does the Examiner rely on *Tomasz* or *McGeehan* to meet the missing parts. Thus the applied art does not teach or suggest every limitation of claim 5 as necessary for a proper rejection under 35 U.S.C. §103. Accordingly, Applicant respectfully asserts that claim 5 is allowable over the applied art.

Moreover, the Examiner's rejection is confusing and improper. The Examiner rejects the claims as being unpatentable over *AAPA* in view of *Tomasz* and further in view of

*McGeehan*. However, in the body of his argument he cites to the *Manuel* to provide a first phase shifter and a second phase shifter. Office Action, page 5. Thus, the rejection is improper because “[w]here a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. M.P.E.P. § 706.02(j). Accordingly, Applicant respectfully asserts the rejection of record should be withdrawn.

In order to further prosecution, Applicant will attempt address the Examiner’s arguments, although those arguments are not clear to the Applicant. The Examiner asserts that the “modified communication system of the *Applicant’s Admitted Prior Art* and *Tomasz* further disclosed each of the first and second mixers comprise a first phase shifter (see *Manuel*, fig. 3/no. 30, fig. 4/no. 54) a second phase shifter (see *Manuel*, fig. 3/no. 38, fig. 4/no. 58) a first mixer (see *Manuel*, fig. 3/no. 32, fig. 4/no. 56), a second mixer (see *Manuel*, fig. 3/no. 34, fig. 4/no. 57).” Office Action, page 5. Again, Applicant would note that the Examiner did not cite to *Manuel* in the rejection of record. However, even the cited components are not as the Examiner asserts. The Examiner’s asserted second phase shifter, in Figure 4/no. 58 is actually a power divider. Column 4, line 11. The Examiner does not assert that any of *AAPA*, *Tomasz*, or *McGeehan* provide the missing limitation. Therefore, the references do not teach or suggest each and every limitation as required for a proper rejection under 35 U.S.C. §103. Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. §103 rejection of claims 5, 34, and 35-37.

#### **No Suggestion or Motivation to Combine**

The Examiner concedes that the combination of *AAPA*, *Tomasz*, and *Manuel* (already shown above as an improper combination) does not disclose a combiner, then he asserts that such combiner is well know in the art and cites to *McGeehan*. Office Action, page 5. Applicant respectfully asserts that there is no motivation for the combination. One skilled in the art would not add *McGeehan’s* combiner to the circuit of *Manuel*, or to the other applied references cited to by the Examiner. The *AAPA* already provides an output signal of the desired quality. The components from *Manuel* do not provide the desired quality unless combined with the more complicated circuits of Figures 7 and 5, as discussed above. See column 10, lines 45-64. Adding a combiner as suggest by the Examiner to the circuit of

Figures 5 and 7 would change the operation of the circuit designed with components to produce its desired signal. Therefore, there is no motivation add a combiner to *Manuel*, and even if one altered the circuit of *Manuel*, there is no reason to alter the *AAPA* circuit which already provides an output signal of the desired quality. See specification, page 9, lines 23-24. Accordingly, the Examiner fails to establish a prima facie case of obviousness.

Moreover, the Examiner asserts the motivation is to “provide an accurate gain and phase matching of the paths through the first and second mixers that can be used to achieve a high degree of cancellation of the unwanted image signal.” Office Action, page 5. Again, the Examiner has used impermissible hindsight pulling his motivation directly out of the present inventions specification, which recites “when the outputs of mixers 221 and 222 are summed by the summer 261, the desired signal components are in-phase and constructively combine while the undesired images are out of phase and destructively combine.” Specification, page 12, lines 20-22. However, “impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of facts gleaned from the prior art.” M.P.E.P. § 2142. There is nothing in the applied references to suggest the Examiner’s recited motivation for the combination. Therefore, there is no suggestion or motivation to combine the applied references in the manner asserted by the Examiner. Accordingly, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103 rejection of record for claims 5 and 34-37.

#### **IV. New Claim**

Claim 38 depends from and inherits all of the limitations of independent claim 34 shown above to be patentable over the applied art. Therefore, claim 38 is allowable, at least, because it depends from and inherits the limitations of claim 34. Accordingly, Applicant respectfully asserts that claim 38 is allowable.

#### **V. Claims Not Addressed**

The Examiner fails to address claims 6-7 in the rejection of record. “In every Office Action, each pending claim should be mentioned by number, and its treatment or status given.” M.P.E.P. § 707.07(i). Although mentioned on the cover page as standing rejected, the Examiner fails to disclose which section of 35 U.S.C. he is relying on for his rejection of

claims 6-7, or which art, if any, he is applying in his rejection. Accordingly, the Examiner has failed to address these claims in this rejection, and the Applicant respectfully asserts these claims are patentable over the applied art.

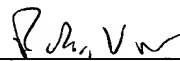
**VI. Conclusion**

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 06-2380, under Order No. 49581/P024US/10006096 from which the undersigned is authorized to draw.

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Respectfully submitted,

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